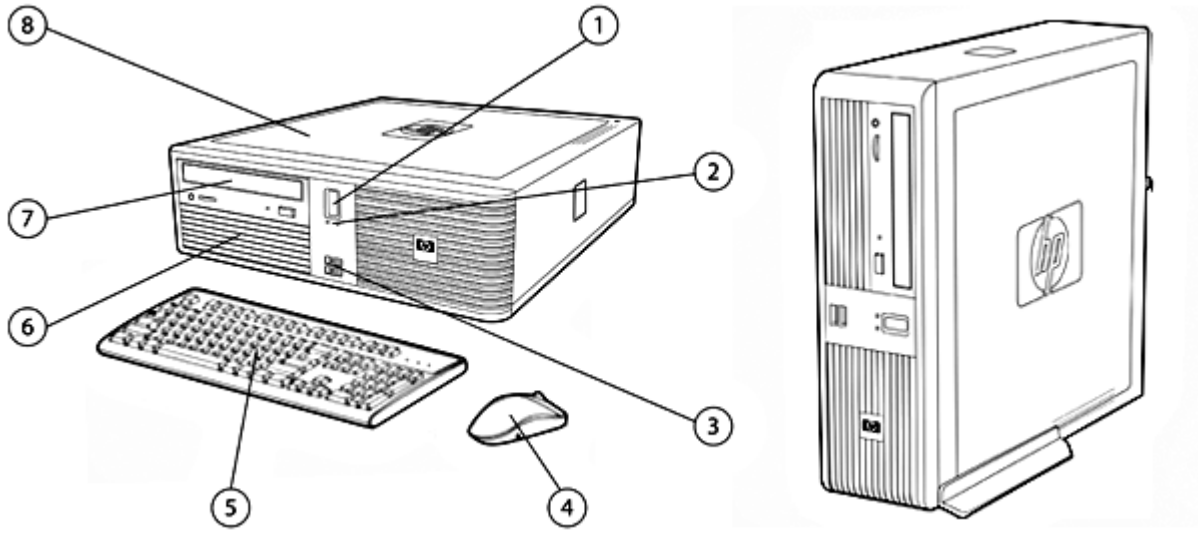
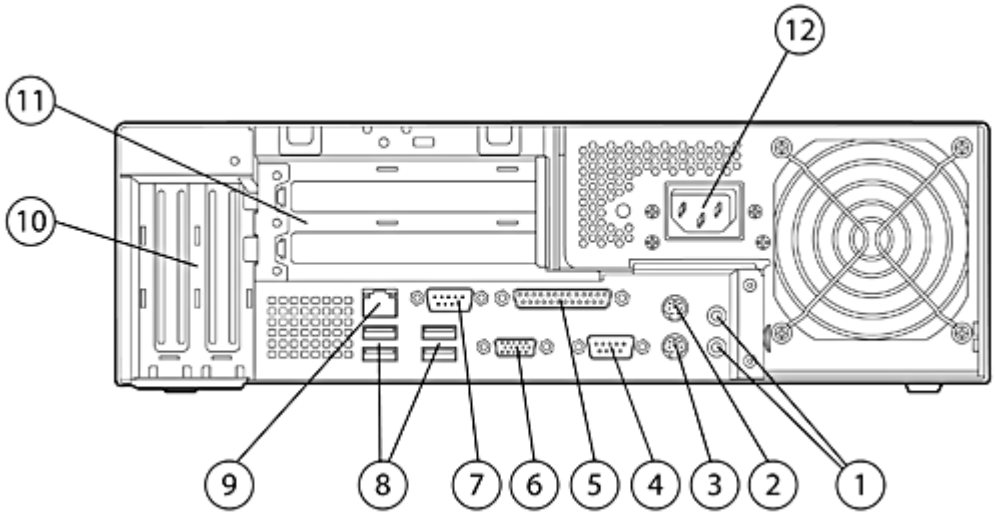
Overview



1. Recessed power button
2. LEDs
3. 2 USB 2.0 ports with rubber cover
4. 2-button optical scroll mouse
5. Keyboard
6. Internal hard drive
7. External optical drive
8. Second internal hard drive



1. Line in and line out audio jacks
2. PS/2 mouse port
3. PS/2 keyboard port
4. RS232 serial COM1 port
5. Parallel port
6. VGA port
7. RS232 serial COM2 port
8. 4 USB 2.0 ports
9. RJ-45 LAN jack
10. 2 low-profile slots: left ADD2/SDVO slot, right PCIe-x1
11. 2 full-height PCI slots
12. 240W 80 PLUS® – Active PFC power supply (no line switching required)

Overview

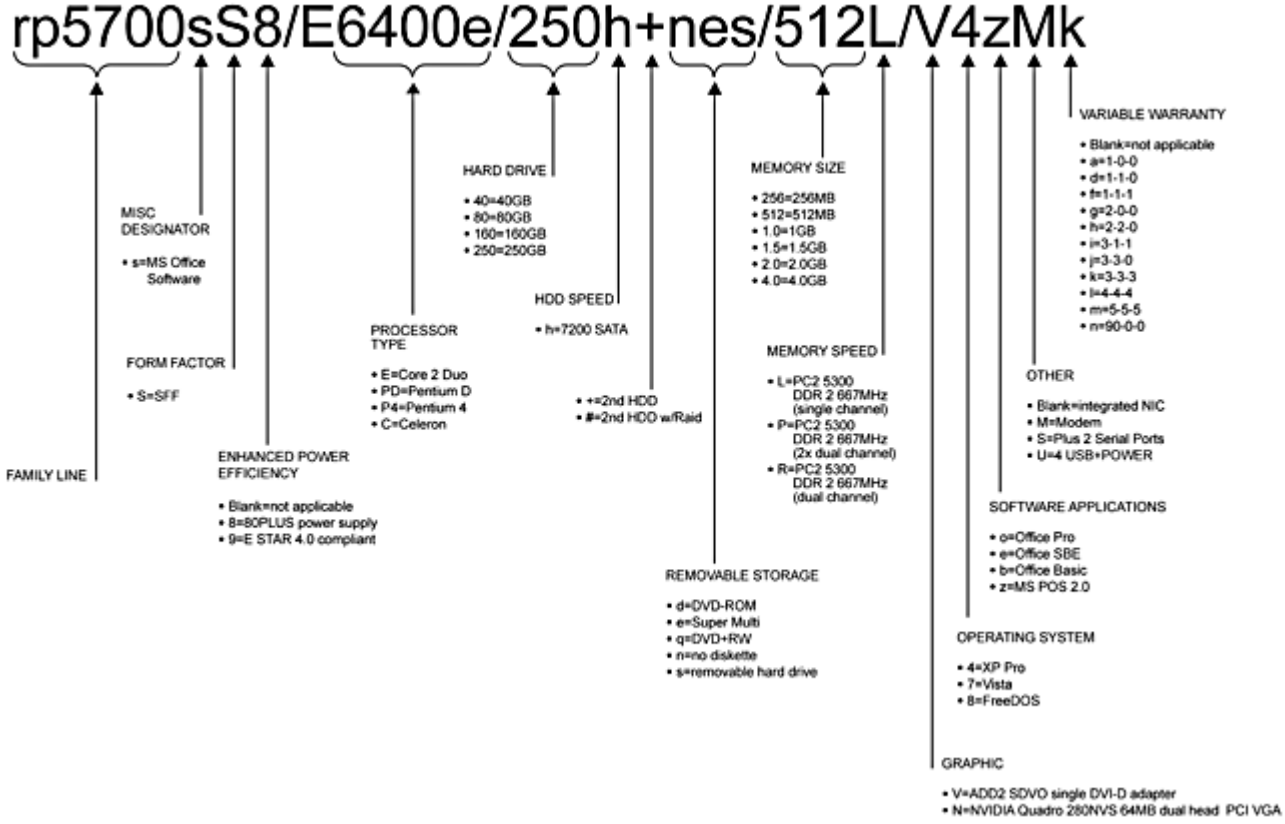
At A Glance

- Intel® Core™2 Duo processor, Intel Pentium® Dual-Core processor, or Intel Celeron® processor
- One of the following operating systems:
  - Genuine Windows® XP Professional
  - Genuine Windows Vista Business 32 edition
  - Genuine Windows Vista Business with downgrade to Windows XP Professional custom installed
  - FreeDOS
- Intel Q963 chipset with Intel GMA 3000 and support for dual independent displays
- Dual Channel, DDR2 667 MHz system memory
- Integrated Broadcom 5755 NIC 10/100/1000 with integrated TPM support
- SMART III serial ATA 3.0Gb/s Hard Drives
- RAID level 0, 1 (HP factory ship standard), and 5 (requires three hard drives) support
- Manageability tools
- 80 PLUS® highly efficient power supply rating standard on all models
- Protected by HP Services, including a 3-3-3, standard warranty. Terms and conditions vary by country. Certain restrictions and exclusions apply.

NOTE: All models and features may not be available in all countries.

Model Key and Example

NOTE: This diagram is an example that illustrates how to read the model number. It is not intended to give every available configuration choice specified in the body of this document and may include references to modules that are out of date and no longer available.



Operating System – One of the following

Genuine Windows Vista Business 32 edition
Genuine Windows Vista Business with downgrade to Windows XP Professional custom installed *†
FreeDOS+

* Certain Windows Vista product features require advanced or additional hardware. See: www.microsoft.com/windowsvista/getready/hardwarereqs.mspx and www.microsoft.com/windowsvista/getready/capable.mspx for details. WindowsVista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit: www.windowsvista.com/upgradeadvisor.

† Windows Vista Business disk may be included for future upgrade if desired. To qualify for this downgrade an end user must be a business (including governmental or educational institutions) and is expected to order at least 25 customer systems with the same custom image.

+ The following features are not supported by Linux:

- Wireless A+G PCI Card (Americas and EMEA models)
- Agere 2006 PCI 56K International SoftModem

Standard and Configurable Components

- NVIDIA GeForce 8400 GS 256MB DH PCIe x1
- Modem RJ11 Telecoms Adapter Kit
- HP USB Smartcard Keyboard

Value-added Software (not included with FreeDOS) Not all software included with all models.

HP ProtectTools Security Software Suite*
HP Client Management Solutions (visit http://www.hp.com/go/easydeploy)
HP Backup and Recovery Manager
HP Insight Diagnostics
Computer Setup Utility
McAfee Total Protection Anti-Virus*
Intervideo WinDVD (supplied with DVD drive)
Microsoft Office-Ready 2007 (60-day trial)
Microsoft Office 2007 Basic*
Microsoft Office 2007 Professional*
Microsoft Office 2007 Small Business*
Microsoft Internet Explorer
HP Client Automation Enterprise
Altiris Deployment Solution Agent
Roxio Easy Media Creator (included with DVD drives)
Sun Java Runtime Environment
Vista Easy Setup
Microsoft Dynamics – Point of Sale 2.0**

* 60 day trial period for McAfee Total Protection for Small Business software. Internet access required to receive updates. First update included. Subscription required for updates thereafter.
** Sold separately.

Value-added Services and Features

HP Stable Platform Program with Product Change Notification
Business-to-Business Portals
Factory Express Deployment and Lifecycle Services (sold separately)
TPM 1.2* Vista Bit-Locker Ready

* TPM module disabled where use is restricted by law; for example, Russia.

Service and Support

On-site Warranty and Service[NOTE 1]This three-year, limited warranty and service offering delivers three years of on-site, next business-day[NOTE 2] service for parts and labor and includes free telephone support[NOTE 3] 24 x 7. Global coverage[NOTE 2] ensures that any product purchased in one country and transferred to another non-restricted country will remain fully covered under the original warranty and service offering.

NOTE 1: Certain restrictions and exclusions apply.

NOTE 2: On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider. Global service response times are based on commercially reasonable best effort.

NOTE 3: Technical telephone support applies only to HP-configured, HP and HP-qualified, third-party hardware and software.

Dimensions and Weight

Chassis Dimensions (HxWxD)	3.94 x 13.4 x 15 in (10 x 34 x 38 cm)
System weight*	18.64 lb (8.433 kg)
System volume	approximately 13 liters (13.74 quarts)
Shipping weight*	26.52 lb (11.998 kg)
Shipping box dimensions	23.38 x 19.68 x 9.00 inches (59.38 x 49.99 x 22.85 cm)
Monitor weight supported	77 lb (35 kg) maximum

* Configured with 2 hard drives, 1 optical drive, no diskette drive, and tower stand.

Standard and Configurable Components

Power Supply	240W 80 PLUS – Active PFC Power Supply. 80 PLUS® rating efficiency. No line switching required.	
Ports	**USB**	6 USB 2.0 (2 front, 4 rear) Plus 4 additional USB+POWER; 3 @ 12V, 1 @ 24V
	Serial	2 RS232 individually configurable to power 5V & 12 V. COM1 can be configured for 5V, 9V, and 12V Plus 2 additional RS232 on some models via PCI card. Individually configurable to power 5V and 12V
	Parallel	1
	PS/2	2
	Video	1
	Audio	2, line in and line out
	NIC	RJ-45
	Support for Multi-Monitor*	available via HP ADD2 SDVO DVI-D Adapter
	* The rp5700 supports normal (or non-reversed) layout (Advanced Digital Display 2) adapter cards inserted into the SDVO (Serial Digital Video Output) connector on the system board. This connector has the physical appearance of a PCIe- x16 connector; however, conventional PCIe cards are not supported in this connector.	
Chipset	Intel Q963 with ICH8-RAID	
Processor and Speed* One of the following	Intel Core2 Duo Processor E7400 (2.80-GHz, 3-MB L2 cache, 1066-MHz FSB) Intel Core2 Duo Processor E6400 (2.13-GHz, 2-MB L2 cache, 1066-MHz FSB) Intel Pentium Dual-Core Processor E2160 (1.80-GHz, 1-MB L2 cache, 800-MHz FSB) Intel Celeron Processor 440 (2-GHz, 512-KB L2 cache, 800-MHz FSB)	
* Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families.		
Memory	**DDR2 SYNCH DRAM NON-ECC MEMORY** Memory upgrades are accomplished by adding single or multiple DIMMs of the same or varied sizes. This chart does not represent all possible memory configurations. The rp5700 supports non-ECC DDR2 PC2-5300 (667-MHz) and PC2-6400 (800 MHz) memory.*	
	HP recommends dual-channel symmetric configurations for maximum performance. For best performance, add the same amount of total memory to each channel and do not mix speeds. For dual-channel symmetric performance, the total amount of memory in each channel must be equal. If speeds are mixed, speed will default to the slowest DIMM. 1-GB DDR2 Synch DRAM 667-MHz or 800-MHz* Non ECC (1 x 1 GB) 2-GB DDR2 Synch DRAM 667-MHz or 800-MHz* Non ECC (1 x 2 GB) 2-GB DDR2 Synch DRAM 667-MHz or 800-MHz* Non ECC (2 x 1 GB) 3-GB DDR2 Synch DRAM 667-MHz or 800-MHz* Non ECC (3 x 1 GB) 4-GB DDR2 Synch DRAM 667-MHz or 800-MHz* Non ECC (4 x 1 GB) 4-GB DDR2 Synch DRAM 667-MHz or 800-MHz* Non ECC (1 x 4 GB)	

Standard and Configurable Components

Maximum Memory

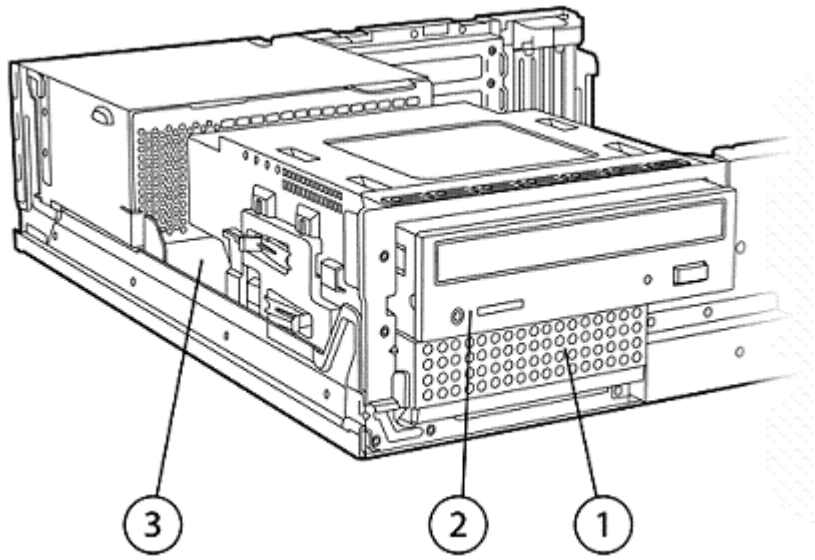
Supports up to 4 GB of DDR2 Synch DRAM.
Slot 1 is black and must always be populated. Not all memory configurations possible are represented below.
* All supported memory modules run at system maximum of 667 MHz.
NOTE: Above 3-GB, all memory may not be available due to system resource requirements.

DIMM Size	Slot			
	Channel A		Channel B	
	1 (black)	2 (white)	3 (black)	4 (white)
1 GB	1 GB			
2 GB	1 GB		1 GB	
2 GB	2 GB			
3 GB	1 GB		2 GB	
3 GB	2 GB		1 GB	
4 GB	1 GB	1 GB	1 GB	1 GB
4 GB	4 GB			

Slots	**PCI**	2 full-height, half-length PCI, 1 half-height PCIe-1x
	SDVO/ADD2	1

Storage	**Internal bays**	2 3.5-inch ATA hard drive
	External bay	1 5.25-inch optical drive
	Hard Drive Interfaces Supported	2 Serial ATA interfaces with RAID controller option. Supports RAID 0, 1, and 10.
	Hard Drive Controller Supported	SATA 3.0 Gb/s and 1.5 Gb/s
	Serial-ATA connectors	3
	Hard Drive – One of the following	80-GB, 250-GB, 500-GB SATA 3.0 Gb/s, 7200 rpm 80-GB, 250-GB, 500-GB SATA 3.0 Gb/s, 7200 rpm with RAID 1
	Removable Storage – One of the following	16X/48X SATA DVD-ROM 16X SATA SuperMulti LightScribe Drive

Standard and Configurable Components



Front View	Quantity Supported	Position	Controller
Diskette Drives	0	0	N/A
3.5-inch Serial ATA Hard Drive	3	1, 2*, 3	SATA
Optical Drive Bay or Carrier for Hard Drive	1	2	SATA

* Requires optional Hard Drive Carrier

Security

TPM 1.2 Embedded Security Chip* integrated with Broadcom NIC
HP ProtectTools Security Software Suite with BIOS Configuration (serial, parallel, USB enable/disable), Credential Manager, Smart Card Manager (sold separately)
HP Desktop Security Lock Kit (lock and cable) (sold separately)
Security cable with Kensington lock (sold separately)
Wall Mount/Security Sleeve (sold separately)
Security loop hole diameter 0.212 inch (0.538 cm)
*NOTE: TPM module disabled where use is restricted by law; for example, Russia.

NIC

Broadcom 5755 10/100/1000 NIC with TPM 1.2 support

Communications

Wireless 801.11 b/g/n PCIe x1 Card (optional)
2006 LSI PCIe x1 56K International SoftModem (optional)
2006 Agere PCI 56K International SoftModem (optional)

Graphics

Integrated Intel Graphics Media Accelerator 3000. Support for dual display via optional HP ADD2 SDVO DVI-D Adapter
NVIDIA Quadr4 290 Graphics card (256MB DH) PCIe x1 - 1st

Standard and Configurable Components

Audio	Intel integrated high-definition audio with 2-channel Realtek ALC262 codec and internal amplified chassis speaker	
Input/Output Devices	Keyboard – One of the following	PS/2 keyboard USB keyboard No keyboard optional
	Mouse – One of the following	PS/2 scroll mouse USB scroll mouse Optical scroll mouse No mouse optional
Miscellaneous	Tower stand (standard)	

After-Market Options

Office 2007 Media-less License Kits (MLKs)	MS Office Basic Edition 2007 – Media-less License Kit	RZ361A#ABA
	MS Office Small Business Edition 2007 – Media-less License Kit	RZ365A#ABA
	MS Office Professional Edition 2007 – Media-less License Kit	RZ363A#ABA
Communications	HP Wireless 802.11 b/g/n PCIe x1	FH971AA
	LSI PCIe x1 Hi-Speed 56K International SoftModem	FH970AA
	Broadcom NetXtreme Gigabit Ethernet PCIe NIC Card	EA833AA
	HP Surge Protector, LAN & Printer Cable	RT174AA
Graphics	NVIDIA Quadro NVS 290 Dual Head PCIe x1, low profile Graphics Card	KN586AA
Hard Drives	HP 80-GB SATA (NCQ/Smart IV) 3.0-Gb/s HDD	PY276AA
	HP 250-GB SATA (NCQ/Smart IV) 3.0-Gb/s HDD	PY278AA
	HP 500-GB SATA (NCQ/Smart IV) 3.0-GB/s HDD	KW347AA
	HP Removable SATA Hard Drive Enclosure (Frame & Carrier)	RY102AA
	HP Removable SATA Hard Drive Enclosure (Carrier Only)	RY103AA
Optical Drives	16X SATA SuperMulti LightScribe Drive (Carbonite color)	GF343AA
	16X/48X SATA DVD-ROM (Carbonite color)	AH047AA
Removable Storage	HP 1.44-MB External USB Diskette Drive	DC141B
Input/Output Devices	HP PS/2 Keyboard	DT527A
	HP USB Keyboard	DT528A
	HP Business Mouse Pad	AT485AA
	USB Mini Keyboard	AS601AA#ABA
	HP 2.4 GHz Wireless Keyboard and Mouse	NB896AA#ABA
	HP PS/2 2-Button Optical Scroll Mouse	EY703AA
	HP USB 2-Button Optical Scroll Mouse (Carbonite/Silver)	DC172B
Memory (DIMMs)	HP 2x2GB PC2-6400 DDR2-800 DIMM	AT983AA
	HP 2GB PC2-6400 DDR2-800 DIMM	BZ723AA
	HP 1GB PC2-6400 DDR2-800 DIMM	BZ722AA
	* All supported memory modules run at system maximum of 667 MHz	
Monitors	CRTs	3PO Offering
	Business LCD Monitors	

HP L1506 15-inch LCD Monitor	PX848AA#ABA
HP w15v 15-inch Widescreen LCD Monitor	FM745AA#ABA
HP w17e 17-inch LCD Monitor	GV537AA#ABA
HP L1710 17-inch LCD Monitor	GS917AA#ABA
HP L1910 19-inch LCD Monitor	GS918AA#ABA
HP L1910i 19-inch LCD Monitor with Integrated Work Stand	GS581AA#ABA
HP L1908w 19-inch Widescreen LCD Monitor	GP536AA#ABA
HP L1908wm 19-inch Widescreen LCD Monitor with multimedia	KA214AA#ABA
HP L1908wi 19-inch Widescreen LCD Monitor with Integrated Work Stand	GP537AA#ABA
HP L2208w 22-inch Widescreen LCD Monitor	GX007AA#ABA
Advantage Series Monitors	
HP L1745 17-inch LCD Monitor	GE178AA#ABA
HP L1750 17-inch LCD Monitor	GF904AA#ABA
HP L1750 17-inch LCD Monitor - TAA Compliant	GF904A2#ABA
HP L1950g 19-inch LCD Monitor	KR145AA#ABA
HP L1950g TAA 19-inch LCD Monitor - TAA Compliant	KR145A2#ABA
HP L1945w 19-inch Widescreen LCD Monitor	KD286AA#ABA
HP L2045w 20-inch Widescreen LCD Monitor	RD125AA#ABA
HP L2245wg 22-inch Widescreen LCD Monitor	FL472AA#ABA
HP L2445w 24-inch Widescreen LCD Monitor	KT931AA#ABA
Performance Series Monitors	
HP LP1965 19-inch LCD Monitor	RA373AA#ABA
HP LP2065 20-inch LCD Monitor	EF227A4#ABA
HP LP2275 22-inch Widescreen LCD Monitor	KE289A4#ABA
HP LP2275 22-inch Widescreen LCD Monitor Bulk Pack (6 baseless units)	KD289A6#ABA
HP LP2475w 24-inch Widescreen LCD Monitor	KD911A4#ABA
HP LP2480zx 24-inch DreamColor Widescreen LCD Monitor	GV546A4#ABA
HP LP3065 30-inch Widescreen LCD Monitor	EZ320A4#ABA
Digital Signage	
HP LD4200 42-inch LCD Monitor	NH322AA#ABA (launching March 9th)
Touchscreen Monitor	
HP L5006tm 15-inch Touch Screen LCD Monitor	RB146AA#ABA
Options	
HP Quick Release Kit	EM870AA
HP Integrated Work Stand (stand alone)	GN783AA
HP DreamColor Advanced Profiling Solution (aka Puck)	KZ300AA
HP LCD Hood Kit	KZ301AA
3M 1 7-in Privacy Screen Filter	KM218AA
3M 19-in Privacy Screen Filter	KZ310AA
Digital Signage Speakers (LD4200 and LD4700)	NK352AA

After-Market Options

	Digital Signage Stand (supports LD4200 Monitor)	NK353AA
	Digital Signage Stand (supports LD4700 Monitor)	EM896AA
Audio	Thin USB Powered Speakers	KK912AA
	LCD Speaker Bar (Black)	NQ576AA
Security	Kensington Security Lock Kit	PC766A
	HP Business PC Security Lock Kit	PV606AA
	HP (SFF) Wall Mount security sleeve	GF344AA
	HP ProtectTools Version 4.0	FH974AA
Miscellaneous Accessories	HP USB Graphics Adapter	NL571AA
	HP ADD2 SDVO DVI-D Adapter	DY674A
	ADD2 SDVO PCIe VGA Adapter	KH540AA
	Belkin USB to Serial Adapter	EM449AA
	Cat5e Patch Cable	AH122AA
	Firewire (1394) Cable	AH123AA
	7-outlet Surge Protector	AG290AA#ABA
	HP FireWire / IEEE 1394 PCI Card	PA997A
	HP DVI to DVI Cable	DC198A
	DMS-59 to Dual VGA Cable Kit	GS567AA
	5.25" Blank Bezel Kit (50 u bulk pack)	DC177B

Unit Environment and Operating Conditions	
General Unit Operating Guidelines • Keep the computer away from excessive moisture, direct moisture and the extremes of heat and cold, to ensure that unit is operated within the specified operating range. • Leave a 10.2-cm (4-in) clearance on front side and power supply side of the computer to permit the required airflow. • If within an enclosure, the front side should be 100% open. The clearance between the system and the cabinet must be at least 10 mm (0.4 inch) on the sides and top and at least 50-mm (2-inch) clearance in the rear with power supply venting area 100% open per the above bullet. • Never restrict airflow into the computer by blocking any vents or air intakes. • Do not stack computers on top of each other or place computers so near each other that they are subject to each other's re-circulated or preheated air. • Occasionally clean the air vents on the front, back, and any other vented side of the computer. Lint, dust and other foreign matter can block the vents and limit the airflow.	
Temperature Range	Operating: 50° to 104 F (10° to 40° C)* Non-operating: -22° to 140° F(-30° to 60° C)
Relative Humidity	Operating: 20% to 85% (non-condensing at ambient) Non-operating: 5% to 90% (non-condensing at ambient)
Maximum Altitude (unpressurized)	Operating: 10,000 ft (3048 m) Non-operating: 30,000 ft (9144 m)
*NOTE: Operating temperature is de-rated 1.0 deg C per 300 m (1000 ft) to 3000 m (10,000 ft) above sea level, no direct sustained sunlight. Maximum rate of change is 10 deg C/Hr. The upper limit may be limited by the type and number of options installed.	

Power Supply	240-watt – 80 PLUS power supply – Active PFC
Operating Voltage Range	90 to 264 VAC
Rated Voltage Range	100 to 240VAC
Rated Line Frequency	50/60 Hz
Operating Line Frequency Range	47 – 63 Hz
Rated Input Current	5 A @ 90 VAC (3.5 A @ 90 VAC with 80% efficient power supply*)
Heat Dissipation	Standard power supply: Typical 340 btu/hr (86 kg-cal/hr) Maximum 1260 btu/hr (397 kg-cal/hr) 80% efficient power supply: Typical 273 btu/hr (69 kg-cal/hr) Maximum 1024 btu/hr (258 kg-cal/hr)
Power Supply Fan	80 mm variable speed fan
ENERGY STAR Compliant	Yes
FEMP Standby Power Compliant (<2W in S5 – Power Off)**	Yes
Power Consumption in ES Mode – Suspend to RAM (S3) (Instantly Available PC)	< 3 W
Processor/Cache Memory Power - Down (S3)	< 3 W
Optical Drive Spins Down When Not In Use	Yes

NOTES:
** Power consumption in the Off/Apparent Off mode is measured and reported with the network interface controller "Wake on LAN" feature disabled in F10 Setup (default is "enabled").

ROM BIOS Information
Key features of the HP BIOS in the rp5700 include: • Deployment and manageability – HP BIOS provides several technologies that help integrate the HP POS system into the enterprise, such as PXE, remote configuration, remote control, and F10 Setup support for 12 languages. • Stability – HP BIOS supports the HP stable product roadmap by releasing only critical BIOS changes to the factory and advanced change notification. • Security – HP BIOS offers a robust and flexible set of security features to help the system administrator secure their systems from removal of sensitive data, and help prevent access by unauthorized users, subversion of OS security policies, removal of hardware, flash of rogue BIOS images, and attacks on BIOS settings. • Thermal and power management – The HP BIOS provides and enables thermal and power management technologies to assist in operating the HP POS system in any enterprise environment. • Serviceability – HP BIOS provides diagnostic and detailed service information. • Upgrades and recovery – HP BIOS provides numerous ways to upgrade HP POS system, including BIOS updates from within DOS (Flashlite), BIOS updates from within Windows (HPQFlash, SSM), HP Client Manager, and fail-safe recovery. In addition, the HP POS system BIOS Utilities tool enables replicated BIOS setup throughout the Enterprise; it is available from within the BIOS software and from the support website. Additional HP BIOS Features • Administrator password – Also known as the setup password, this helps prevent unauthorized changes to the system configuration. If the administrator password is not known, the BIOS version cannot be changed and changes cannot be made to BIOS settings using F10 setup or under the OS. • Advanced Configuration and Power Interface (ACPI) – Represents a significant innovation in power and configuration management, allowing operating systems and applications to manage power based on activity and usage. Provides power conservation features under Windows XP. • Ability to disable the internal speaker

Other Features	Description
ACPI-Ready Hardware	Advanced Configuration and Power Management Interface (ACPI). • Allows the system to wake from a low power mode. • Controls system power consumption, making it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system.
SMBIOS Ver. 2.4	System Management BIOS, previously known as DMI BIOS, for system management information
Wired for Management Support	Intel-driven, industry-wide initiative to make Intel architecture-based PCs, servers and mobile computers more inherently manageable right out of the box and over the network
Dual-State Power Button	Power button acts as both an on/off button and suspend-to-sleep button

Technical Specifications

Serviceability Features of System		
Dual Color Power LED on Front of Computer (Indicates Normal Operations and Fault Conditions)		
Diagnostic LED Explanation Table	Number of 1-second red LED blinks followed by 2-second pause, then repeats: 2-processor thermal protection activated 3-processor not installed 4-power supply failure 5-memory error 6-video error 7-PCA failure (ROM detected failure prior to video) 8-invalid ROM, bootblock recover mode	
• System/Emergency ROM	• Flash ROM	• CMOS Battery Holder for easy Replacement
• Flash Recovery with Video	• 3.3V Aux Power LED on System PCA	• Processor ZIF Socket for easy Upgrade
• Over-Temp Warning on Screen (Requires IM Agents)	• Clear Password Jumper	• DIMM Connectors for easy Upgrade
• Restore CD	• Clear CMOS Jumper	• NIC LEDs (integrated) (Green & Amber)

Serviceability Features of Chassis		
• Dual Color Power LED – To indicate normal operations and fault conditions	• Color coordinated cables and connectors	• Tool-less removal of hood power supply, slot cover, hard drive and optical drive
• Front power switch	• System memory can be upgraded without removing any internal components	

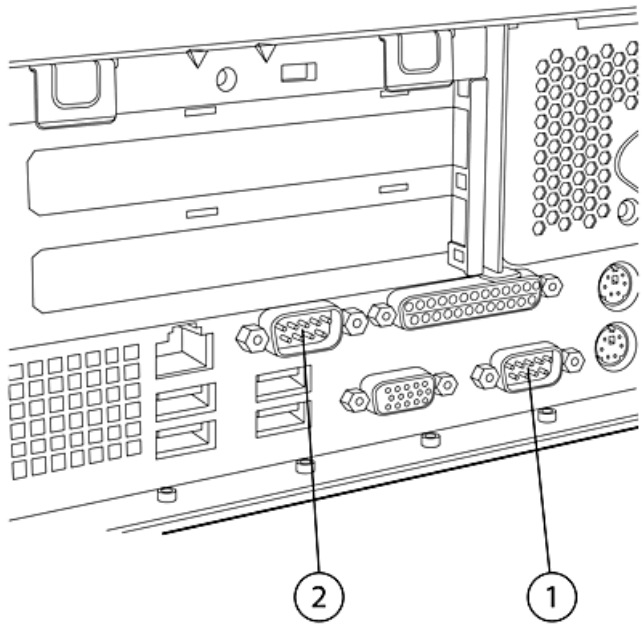
Feature	Description
ASF 2.0 support (Alert Standard Format)	Industry-standard specification for network alerting and remote control in operating system-absent environments
Towerable	Product can be oriented as a tower (in addition to desktop orientation)
Drive Self Tests (DPS)	• Drive Protection System • A diagnostic hard drive self test. It scans critical physical components and every sector of the hard drive for physical faults and then reports any faults to the user. • Running independently of the operating system, it can be accessed through a Windows-based diagnostics utility or through the computer's setup procedure. It produces an evaluation on whether the hard drive is the source of the problem and needs to be replaced. • The system expands on the Self-Monitoring, Analysis, and Reporting Technology (SMART), a continuously running systems diagnostic that alerts the user to certain types of failures.
DPS Access through F10 Setup during Boot	
SMART Technology (Self-Monitoring, Analysis and Reporting Technology)	Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted
SMART I – Drive Failure Prediction	• Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count • By avoiding actual hard drive failures, SMART hard drives act as "insurance" against unplanned user downtime and potential data loss from hard drive failure
SMART II – Off-Line Data Collection	
SMART III – Off-Line Read Scanning with Defect Reallocation	

Technical Specifications - Audio

High Definition Audio	Type	Integrated
	High Definition Stereo Codec	Yes – Realtek ALC262 codec
	Audio Jacks	Line-In (64-K ohm Input Impedance) Line-Out * (200 ohms Output Impedance, expects at least a 10-K ohm load)
	* Internal speaker amplifier is for internal speaker only. External speakers need to be powered externally.	
	Sampling	8 kHz – 192 kHz
	Wavetable Syntheses (software)	Yes – OS soft wavetable
	Analog Audio	Yes
	Number of Channels on Line-Out (mono/stereo)	Stereo (Left & Right channels)
	Internal Audio Speaker Power Rating	1.5 W
	Internal Speaker	Yes
	External Speaker Jack (Line-Out)	Yes

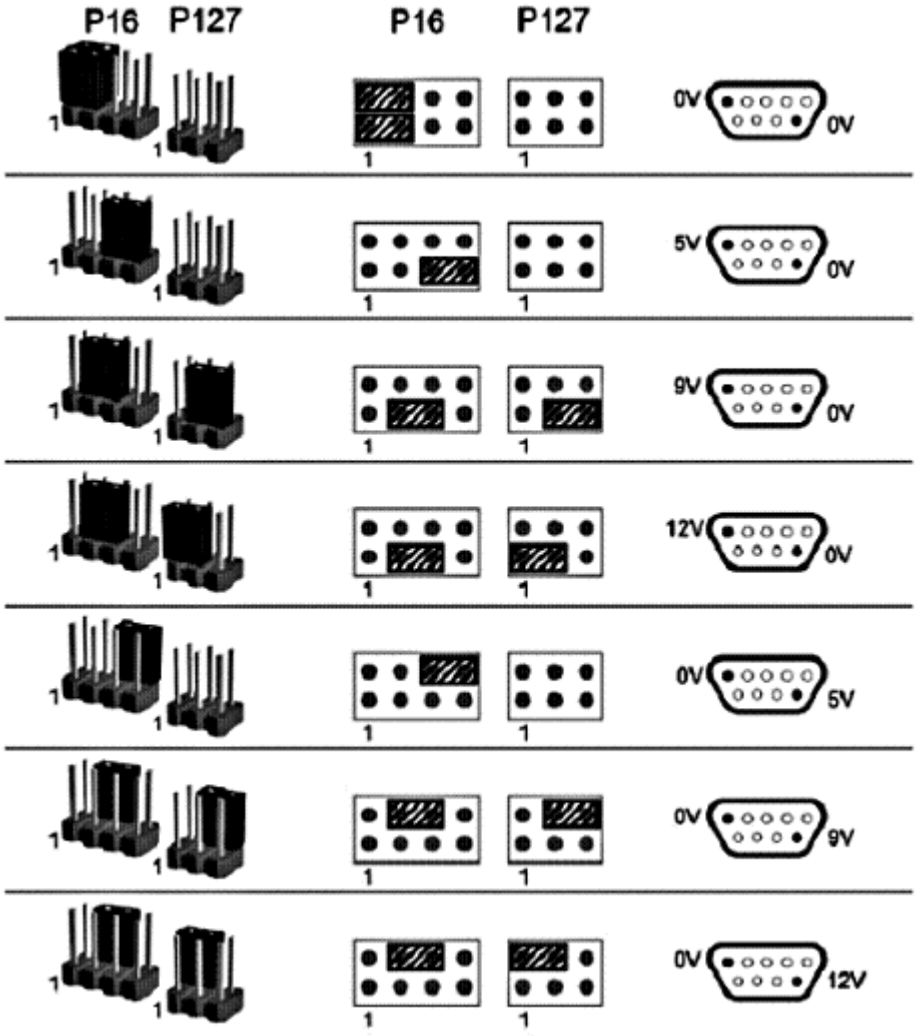
Serial Ports

All serial (COM) ports can be custom configured in either standard mode or powered mode. By repositioning the jumpers (provided) on the system board and on the COM port PCI add-in card (some models), each COM power can achieve power on pin 1 or pin 9. The illustration and table below indicate the COM port assignments and voltage supported for each COM port.

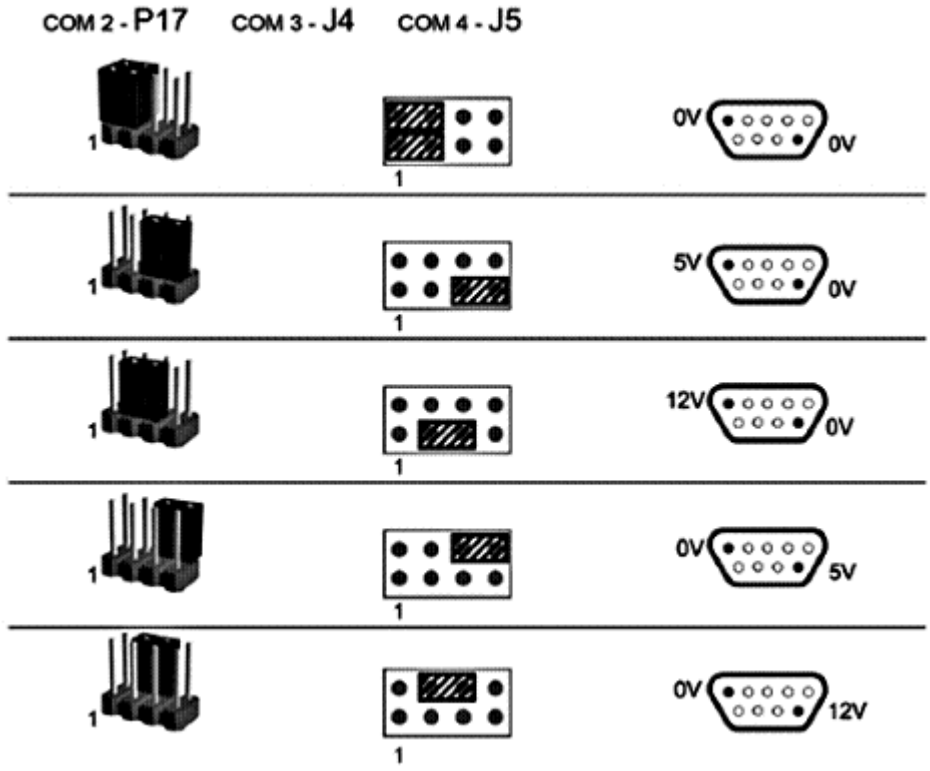


COM port assignment	Description	Standard Mode	+5V	+9V	+12V
1	COM1 (yellow)	Yes	Yes	Yes	Yes
2	COM2	Yes	Yes	No	Yes
3	COM3 (some models)	Yes	Yes	No	Yes
4	COM4 (some models)	Yes	Yes	No	Yes

The following illustrations show how to position the jumpers on the system board and on the COM port PCI add-in card (available on some models) to achieve power on pin 1 or pin 9.
P16 and P127 are located on the system board behind the COM1 port.



P17 and J4 are located on the optional COM port card



Integrated Broadcom 5755 Gigabit Ethernet	Connector	RJ-45
	Controller	Broadcom 5755 PCI-Express LAN Controller
	Memory	Integrated 96Kb frame buffer memory
	Data rates supported	10/100/1000 Mbps
	Compliance	IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	Bus architecture	PCI-E
	Data path width	Single channel, PCI-E
	Data transfer mode	Bus-master DMA
	Hardware certifications	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union
	Power requirement	1.33 watts @ +3.3V AUX supply with 5V tolerance
	Boot ROM support	Yes
	Network transfer mode	Full-duplex Half-duplex (not available for the 1000BASE-T transceiver)
	Network transfer rate	10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T (full-duplex) 2000 Mbps

	Environmental	Operating temperature	32° to 131°F (0° to 55° C)
		Operating humidity	85% at 131° F (55° C)
	Management capabilities	ASF 2.0, ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Broadcom mgmt utility	
	Alerting	ASF 2.0	
LSI PCIe x1 Hi-Speed 56K International SoftModem	Data Transmission	Technology speeds: 56,000 Kbps maximum downstream data, controllerless NOTE: 56 Kbps technology refers to download speeds only and requires compatible modems at server sites. Other conditions may limit modem speed. FCC limitations allow a maximum of 53 Kbps during download transmissions.	
	Data Speeds	(Upload only) 33,600/31,200/28,800/26,400/21,600/19,200/16,800/14,400/12,000/9,600/7,200/4,800/2,400/1,200/300	
	Data Standards	ITU-T V.90, ITU-T, ITU-T V.34, V.44, V.42, V.42bis21, V.32bis, Bell 212A, and Bell 103	
	Fax Speeds	14,400/12,000/9,600/7,200/4,800/2,400/1,200/300 b/s	
	Fax Mode Capabilities	ITU-T T.31 class 1 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2	
	Error Correction and Data Compression	V.44, 42bis, V.42 and MNP2-5	
	Power Management	PCI Bus Power Management Interface Specification (PCI-PM) Revision 1.2, Appendix A. D0, D3hot, and D3cold. Wake on Ring state when in D3cold. If the power management event (PME) feature is enabled in D3cold, a modem can wake the system via WAKE# (WAKEN) or beacon. Meets PCI Express 1.1 standard.	
	Upgradeability	Driver upgradeable for future enhancements	
	Video	ITU-T V.80 video ready interface	
	Other	TIA/EIA 602 standard AT command set	
		Integrated DTE interface with speeds of up to 115.2 Kbps, parallel 16550a UART-compatible interface	
		Optional ring wakeup signal	
	Operating Temperature	32° to 158° F (0° to 70° C)	
	Operating Humidity	20% to 90%, non-condensing	
	Power	Requires a 3.3-V auxiliary power rail on PCI express bus	
		Uses only one PCI express load (i.e., one grant/request pair), one shared IRQ, one electrical load	
	Chipset	LSI SV92EX - Integrated PCI interface with 3.3-V tolerant buffers and CardBus support	
	Dimensions (L X H)	Complies with PCI express low profile specifications-6.7 x 2.3 in (17.0 x 5.8 cm) and supports high- and low-profile brackets	
	Connection	Single RJ-11 connector	
	Other Features	Digital line protection, call progress monitoring via on-board piezo device, support for high profile and low profile brackets, PnP ID support	

Technical Specifications - Communications

	Safety	UL recognized to UL 1950, 3rd edition (U.S. and Canada); IEC 950 (TUV, NEMKO, DEMKO, SEMKO); CE Mark, EC 950 (TUV, NEMKO, DEMKO, SEMKO, CE mark
	EMC	FCC Part 15, IC ES003, EN 55022, 3rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8
	Telecom	FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals Not available in Korea or the Republic of South Africa.
	Other	The SV92EX device is packaged in a 32-pin micro leadless chip carrier (MLCC). The SV92EX is fully compliant with the PCI Express revision 1.1 specification. WHQL approved; ASPM compliant.

HP Wireless 802.11b/g/n PCIe	Dimensions (LxH)	3.3 x 4.7 inches (8.5 x 12 cm)		
	Weight	0.08 pounds (40 g)		
	Controller	Ralink RT2790		
	System interface	PCIExpress x1		
	Network standard	802.11 b/g/n		
	Frequency band	2.400 - 2.497 GHz		
	Operating temperature	14° to 149°F, operating (-10° to 65°C, operating)		
	Storage temperature	-40° to 176°F, non-operating (-40° to 80°C, non-operating)		
	Humidity	10-90% operating 5-95% non-operating		
	Operating voltage	3.3V +/- 9% 12V +/- 8%		
	Power consumption	Platform/WLAN Mode	Power Consumption	
		Maximum Power Consumption	10 Watts	
		Transmit Only	4 Watts maximum averaged power over 1 second	
		Transmit Packet or Active Scanning	1000 mA peak current for 100 microseconds or longer	
		Receive Only Mode or Idle without IEEE PSP mode enabled	3 Watts maximum averaged over 1 second	
		Idle, with IEEE PSP mode enabled	1.0 Watts maximum averaged over 1 second	
		Transmit Disabled (turned off in software)	50 mW maximum, averaged over 1 second	
		Platform in S3 or S4 (power removed from Low Profile PCI Express Card)	5 mW maximum, averaged over 1 second	
	Output power (approximately)	802.11b modes	802.11g modes	EWC modes
		+19 dBm +/- 1.0 dB maximum	+17 dBm +/- 1.0 dB maximum	+17 dBm +/- 1.0 dB maximum (total power in all transmit chains)

Receive sensitivity	Mode	Data rate	Sensitivity
	802.11b	1 Mbps	-94 dBm
	802.11b	11 Mbps	-85 dBm
	802.11g	6 Mbps	-91 dBm
	802.11g	18 Mbps	-85 dBm
	802.11g	48 Mbps	-75 dBm
	802.11g	54 Mbps	-72 dBm
	EWC (2.4 GHz)	6.5 Mbps	-87 dBm
	EWC (2.4 GHz)	54 Mbps	-82 dBm
	EWC (2.4 GHz)	81 Mbps	-78 dBm
	EWC (2.4 GHz)	162 Mbps	-74 dBm
	EWC (2.4 GHz)	270 Mbps	-68 dBm
	EWC (2.4 GHz)	300 Mbps	-64 dBm
Data transfer rate	Data Rate (MCS)	Minimum Throughput	
	1 Mbps (802.11 b)	700 kbps	
	2 Mbps (802.11 b)	1.4 Mbps	
	5.5 Mbps (802.11 b)	3.5 Mbps	
	11 Mbps (802.11 b)	5.9 Mbps	
	12 Mbps (802.11 g)	6 Mbps	
	18 Mbps (802.11 g)	9 Mbps	
	24 Mbps (802.11 g)	12 Mbps	
	36 Mbps (802.11 g)	18 Mbps	
	48 Mbps (802.11 g)	21 Mbps	
	54 Mbps (802.11 g)	22.5 Mbps	
	6.5 Mbps (20 MHz EWC)	4.5 Mbps	
	13 Mbps (20 MHz EWC)	9 Mbps	
	19.5 Mbps (20 MHz EWC)	13.5 Mbps	
	26 Mbps (20 MHz EWC)	18 Mbps	
	39 Mbps (20 MHz EWC)	27 Mbps	
	52 Mbps (20 MHz EWC)	36 Mbps	
	58.5 Mbps (20 MHz EWC)	40 Mbps	
	65 Mbps (20 MHz EWC)	45 Mbps	
	78 Mbps (20 MHz EWC)	54 Mbps	
	104 Mbps (20 MHz EWC)	72 Mbps	
	117 Mbps (20 MHz EWC)	81 Mbps	
	130 Mbps (20 MHz EWC)	91 Mbps	
	13.5 Mbps (40 MHz EWC)	8 Mbps	
	27 Mbps (40 MHz EWC)	16 Mbps	

		40.5 Mbps (40 MHz EWC) 24 Mbps 54 Mbps (40 MHz EWC) 32 Mbps 81 Mbps (40 MHz EWC) 48 Mbps 108 Mbps (40 MHz EWC) 64 Mbps 121.5 Mbps (40 MHz EWC) 72 Mbps 135 Mbps (40 MHz EWC) 81 Mbps
	Security	• IEEE and WiFi compliant 64 / 128 bit WEP encryption • AES: CCM • 802.1x authentication • WPA: 802.1x. WPA-PSK and TKIP • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through V5
	Antenna	HP part number 497792-001
	Certifications	Wi-Fi certified
	Certifications for use by country	United States, Canada, Peru, Taiwan
2006 Agere PCI 56K International SoftModem	Data Transmission	Technology speeds: 56,000 Kbps maximum downstream data, controllerless NOTE: 56 Kbps technology refers to download speeds only and requires compatible modems at server sites. Other conditions may limit modem speed. FCC limitations allow a maximum of 53 Kbps during download transmissions.
	Data Speeds	(Upload only) 33,600/31,200/28,800/26,400/21,600/19,200/16,800/14,400/12,000/9,600/7,200/4,800/2,400/1,200/300
	Data Standards	ITU-T V.90, ITU-T, ITU-T V.34, V.44, V.42, V.42bis21, V.32bis, Bell 212A, and Bell 103
	Fax Speeds	14,400/12,000/9,600/7,200/4,800/2,400/1,200/300 b/s
	Fax Mode Capabilities	ITU-T T.31 class 1 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2
	Error Correction and Data Compression	V.44, 42bis, V.42 and MNP2-5
	Power Management	ACPI; PPMI 1.1 and wake support with PME and Vaux; meets PCI 2.3 requirements and PC 2001 requirements
	Upgradeability	Driver upgradeable for future enhancements
	Video	ITU-T V.80 video ready interface
	Other	TIA/EIA 602 standard AT command set Integrated DTE interface with speeds of up to 115.2 Kbps, parallel 16550a UART-compatible interface Optional ring wakeup signal
	Operating Temperature	32° to 158° F (0° to 70° C)
	Operating Humidity	20% to 90%, non-condensing

Technical Specifications - Communications

Power	Requires a 3.3-V auxiliary power rail on PCI bus Uses only one PCI load (i.e., one grant/request pair), one shared IRQ, one electrical load
Chipset	Agere Systems SV92PL – Integrated PCI interface with 5-V tolerant buffers and CardBus support
Dimensions (L X H)	Complies with PCI low profile specifications–6.7 x 2.3 in (17.0 x 5.8 cm) and supports high- and low-profile brackets
Connection	Single RJ-11 connector
Other Features	Digital line protection, call progress monitoring via on-board piezo device, support for high profile and low profile brackets, PnP ID support
Safety	UL recognized to UL 1950, 3rd edition (U.S. and Canada); IEC 950 (TUV, NEMKO, DEMKO, SEMKO); CE Mark, EC 950 (TUV, NEMKO, DEMKO, SEMKO, CE mark
EMC	FCC Part 15, IC ES003, EN 55022, 3rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8
Telecom	FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals Not available in Korea or the Republic of South Africa.
Other	Bare PCB material compliant to 94V-0 or better (marked as such) PC 2001 compliant, PCI version 2.3, WHQL approved; ACPI compliant

Technical Specifications - Graphics

Integrated Graphics Media Accelerator 3000	Graphic Controller	Integrated GMA 3000
	Bus type	Integrated
	RAMDAC	Single 400 MHz integrated
	Memory	UMA with DVMT 4.0 support for frame buffer sizes 8-256 MB
	Controller clock speed	667 MHz
	Overlay planes	One 16-bit video overlay plane
	Maximum Color Depth	32 bpp
	Maximum vertical refresh rate	85 Hz
	Multi-display Support	One VGA and one DVI-D in conjunction with an ADD2 card, clone and extended desktop modes are enabled by the addition of the HP ADD2 DVI-D Adapter
	Graphics/Video API Support	DirectX 9.0c, WGF 1.0, DirectX VA 2.0, Shader Model 3.0, OpenGL 1.5

Resolutions Supported[1]

Resolution	Maximum Refresh Rate (Hz)	
	Analog Monitor	Digital Monitor
640 x 480	85	60
800 x 600	85	60
1024 x 768	85	60
1280 x 1024	85	60
1600 x 1200	85	60
1920 x 1080	85	60-R[2]
1920 x 1200	85	60-R[2]
1920 x 1440	60	N/A

NOTES:

[1] Modes listed are supported with a single active display. The supported mode list for multiple active displays is a subset of this list. Not all modes will support video playback and some supported modes may use software MC (motion compensation) rather than hardware MC. Not all modes will support 3D acceleration depending on the system configuration (e.g., resolution selected, size of frame buffer, number of installed memory modules, etc.).

[2] -R denotes reduced blanking timings (some digital monitors may not support reduced blanking timings).

Other resolutions and refresh rates may be selectable but are not recommended.

Technical Specifications - Graphics

ADD2 SDVO DVI-D Adapter

Form Factor	Low-profile card (full-height (ATX) and low-profile brackets included in kit)
Dual head support	Yes
Host Interface Connector	• Mechanically compliant with PCI-e standard • Complies with the Intel ADD2 and Intel Serial Digital Video Output (SDVO) specifications
Dot Clock	165 MHz maximum
Display Modes	Supports display modes that require up to 165-MHz bandwidth on the link, as shown in the following table.

Resolutions Supported

Resolutions	60-Hz LCD	60-Hz	75-Hz	85-Hz
Blanking	5% reduced	GTF	GTF	GTF
640 x 480 VGA	Yes	Yes	Yes	Yes
800 x 600 SVGA	Yes	Yes	Yes	Yes
1024 x 768 XGA	Yes	Yes	Yes	Yes
1280 x 1024 SXGA	Yes	Yes	No	No
1600 x 1200 UXGA	Yes	Yes	No	No
1920 x 1200	Yes	No	No	No

Color Depth	All modes support 8-bpp, 16-bpp, and 24-bpp color depths (up to 16.7 million colors)

NVS 290 x1 PCIe Graphics Card

Bus type	PCIe x1 Low profile, both ATX and low profile brackets included
Graphics Controller	Integrated Quadro 290 2D graphics processor unit (GPU) Core clock 460MHz
Memory	256 MB DDR2, 64 bit wide, Memory clock 400MHz
Connector	Single high-density DMS-59 Flex Connector
Dimensions	Low-profile, 2.586 x 6.6 in (6.57 x 16.76 cm)
Multi-monitor support	Dual analog or digital (Single Link DVI) monitors (DVI support requires optional DVI cable kit DL139A)
RAMDAC	Dual 350 MHz (integrated)
Maximum pixel clock	350 MHz
Overlay planes	One 1-bit Video overlay plane
High-defintion Video Processor (HDVP)	Full screen, full frame video playback of HDTV and DVD content DVD-ready motion compensation for MPEG-2 Independent hardware color controls for video overlay Hardware color-space conversion (YUV 4:2:2 and 4:2:0) IDCT motion compensation 5-tap horizontal by 3-tap vertical filtering 8:1 up/down scaling
Display options	Supports two displays via included DMS-59 to dual VGA cable or 2 DVI monitors via optional DMS-59 to dual DVI-I single-link connectors cable kit part number: DL139A

Technical Specifications - Graphics

Resolutions supported

Resolution	Maximum Refresh Rate (Hz)	
	Analog Monitor	Digital Monitor
640 x 480	85	60
800 x 600	85	60
1024 x 768	85	60
1280 x 720	85	60
1280 x 1024	85	60
1440 x 900	75	60
1600 x 1200	85	60
1680 x 1050	75	60
1920 x 1080	85	60-R*
1920 x 1200	85	60-R*
1920 x 1440	85	N/A
2048 x 1536	75	N/A
2560 x 1600	N/A	N/A

* 60-R denotes reduced blanking timings are used on single-link DVI connections and may be used with other digital connections.

Serial ATA 3.0-Gb/s Hard Drives (7200 rpm)	1 TB	**Capacity**	1,000,204,886,016 byte
		Height	1 in (2.54 cm)
		Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)
		Interface	Serial ATA (3.0 Gb/s
		Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s
		Buffer	32 MB
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track** 2.0 ms **Average** 11 ms **Full-Stroke** 21 ms
		Rotational Speed	7,200 rpm
		Logical Blocks	1,953,525,168
		Operating Temperature	41° to 131°F (5° to 55°C)
	500 GB	**Capacity**	500,107,862,016 bytes
		Height	1 in (2.54 cm)
		Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)
		Interface	Serial ATA (3.0 Gb/s)
		Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s
		Buffer	16 MB
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track** 2.0 ms **Average** 11 ms **Full-Stroke** 21 ms
		Rotational Speed	7,200 rpm
		Logical Blocks	976,773,168
		Operating Temperature	41° to 131° F (5° to 55° C)
	250 GB	**Capacity**	250,059,350,016 bytes
		Height	1 in (2.6 cm)
		Width	Media diameter: 3.5 in (8.9 cm) Physical size: 4 in (10.2 cm)
		Interface	Serial ATA (3.0 Gb/s)
		Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s
		Buffer	8 MB

Technical Specifications - Hard Drives

Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	1.0 ms
	Average	8.5 ms
	Full-Stroke	18 ms
Rotational Speed	7,200 rpm	
Logical Blocks	488,397,168	
Operating Temperature	41° to 131°F (5° to 55°C)	

2.5" Solid State Drives	64-GB	Capacity	64 GB	
		NAND Flash Memory	Multi Level Cell (MLC) with wear leveling controller	
		Interface type	SATA 3Gb/sec	
		Dimensions-external (W x H x D)	2.74 x 0.37 x 4 in (6.98 x 0.95 x 10.2 cm)	
		Weight	0.14 lb (65 g)	
		Internal transfer rate	Write speed	Up to 220 MB/s
			Read speed	Up to 120 MB/s
		Host transfer rate	Ultra DMA mode	Up to 150 MB/s
		Environmental (all conditions, non-condensing)	Temperature (operating)	32° to 158° F (0° to 70° C)
			Relative Humidity (operating)	5% to 95%
			Maximum Wet Bulb Temperature (operating)	84° F (29° C)

Technical Specifications - Input/Output Devices

USB Keyboard	Physical characteristics	Keys	104, 105, 106, 107, 109 layout
		Dimensions (L x W x H)	18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)
		Weight	2 lb (0.9 kg) minimum
	Electrical	Operating voltage	+ 5VDC ± 5%
		Power consumption	50-mA maximum (with three LEDs ON)
		System interface	USB Type A plug connector
		ESD	CE level 4, 15-kV air discharge
		EMI – RFI	Conforms to FCC rules for a Class B computing device
		Microsoft PC 99 – 2001	Functionally compliant
	Mechanical	Languages	38 available
		Keycaps	Low-profile design
		Switch actuation	55-g nominal peak force with tactile feedback
		Switch life	20 million keystrokes (using Hasco modified tester)
		Switch type	Contamination-resistant switch membrane
		Key-leveling mechanisms	For all double-wide and greater-length keys
		Cable length	6 ft (1.8 m)
		Microsoft PC 99 – 2001	Mechanically compliant
		Acoustics	43-dBA maximum sound pressure level
	Environmental	Operating temperature	50° to 122° F (10° to 50° C)
		Non-operating temperature	–22° to 140° F (–30° to 60° C)
		Operating humidity	10% to 90% (non-condensing at ambient)
		Non-operating humidity	20% to 80% (non-condensing at ambient)
		Operating shock	40 g, six surfaces
		Non-operating shock	80 g, six surfaces
		Operating vibration	2-g peak acceleration
		Non-operating vibration	4-g peak acceleration
		Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence
		Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence
	Approvals	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC	
	Ergonomic compliance	ANSI HFS 100, ISO 9241-4, and TUVGS	

Technical Specifications - Input/Output Devices

PS/2 Keyboard	Physical characteristics	Keys	104, 105, 106, 107, 109 layout
		Dimensions (L x W x H)	18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)
		Weight	2 lb (0.9 kg) minimum
	Electrical	Operating voltage	+ 5VDC ± 5%
		Power consumption	50-mA maximum (with three LEDs ON)
		System interface	PS/2 6-pin mini din connector
		ESD	CE level 4, 15-kV air discharge
		EMI – RFI	Conforms to FCC rules for a Class B computing device
		Microsoft PC 99 – 2001	Functionally compliant
	Mechanical	Languages	38 available
		Keycaps	Low-profile design
		Switch actuation	55-g nominal peak force with tactile feedback
		Switch life	20 million keystrokes (using Hasco modified tester)
		Switch type	Contamination-resistant switch membrane
		Key-leveling mechanisms	For all double-wide and greater-length keys
		Cable length	6 ft (1.8 m)
		Microsoft PC 99 – 2001	Mechanically compliant
		Acoustics	43-dBA maximum sound pressure level
	Environmental	Operating temperature	50° to 122° F (10° to 50° C)
		Non-operating temperature	–22° to 140° F (–30° to 60° C)
		Operating humidity	10% to 90% (non-condensing at ambient)
		Non-operating humidity	20% to 80% (non-condensing at ambient)
		Operating shock	40 g, six surfaces
		Non-operating shock	80 g, six surfaces
		Operating vibration	2-g peak acceleration
		Non-operating vibration	4-g peak acceleration
		Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence
		Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence
	Approvals	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC	
	Ergonomic compliance	ANSI HFS 100, ISO 9241-4, and TUVGS	

Technical Specifications - Input/Output Devices

HP PS/2 Scroll Mouse	Dimensions	1.5 x 2.5 x 4.6 in (3.8 x 6.3 x 11.6 cm)	
	Weight	4.44 oz (126 g)	
	Environmental	Operating temperature	50° to 122° F (10° to 50° C)
		Non-operating temperature	–22° to 140° F (–30° to 60° C)
		Operating humidity	10% to 90% (non-condensing at ambient)
		Non-operating humidity	20% to 80% (non-condensing at ambient)
		Operating shock	40 g, 6 surfaces
		Non-operating shock	80 g, 6 surfaces
		Operating vibration	2 g peak acceleration
		Non-operating vibration	4 g peak acceleration
		Drop (out-of-box)	26 in (66 cm) on carpet, 6-drop sequence
		Drop (out-of-box)	1 m on asphalt tile over concrete, 6-drop sequence
	Electrical	Operating voltage	5 VDC ± 10%
		Power consumption	15 mA
		System consumption	PS/2 mini-din connector
		ESD	CE level 4, 15 kV air discharge
		EMI-RFI	Conforms to FCC rules for a Class B computing device
		Microsoft PC99 – 2001	Functionally compliant
	Mechanical	Resolution	400 ± 20% DPI
		Tracking speed	10 in/s (25.4 cm/s) maximum
		Acceleration	100 in/s/s (2.54 m/s/s)
		Switch actuation	65 g nominal peak force
		Switch life	1,000,000 operations (using Hasco modified tester)
		Switch type	Low force micro-switches
		Tracking mechanism life	155 mi (250 km) at average speed of 10 in/s
		Cable length	6 ft (1.8 m)
		Microsoft PC99 – 2001	Mechanically compliant
	Scroll wheel	Width	8 mm
		Diameter	0.99 in (25.2 mm)
		Maximum rotation speed	30 mm/s
		Switch type	Light force micro-switch
		Switch life	1 million operations
		Mechanical life	Minimum 200,000 revolutions
	Regulatory approvals	Compliant	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC

Technical Specifications - Input/Output Devices

USB Scroll Mouse	Environmental	Operating temperature	50° to 122° F (10° to 50° C)
		Non-operating temperature	-22° to 140° F (-30° to 60° C)
		Operating humidity	10% to 90% (non-condensing at ambient)
		Non-operating humidity	20% to 80% (non-condensing at ambient)
		Operating shock	40 g, 6 surfaces
		Non-operating shock	80 g, 6 surfaces
		Operating vibration	2 g peak acceleration
		Non-operating vibration	4 g peak acceleration
		Drop (out-of-box)	26 in (66 cm) on carpet, 6-drop sequence
			1 m on asphalt tile over concrete, 6-drop sequence
	Electrical	Operating voltage	5 VDC ± 10%
		Power consumption	15 mA
		System consumption	USB Type-A plug connector
		ESD	CE level 4, 15 kV air discharge
		EMI-RFI	Conforms to FCC rules for a Class B computing device
		Microsoft PC99 – 2001	Functionally compliant
	Mechanical	Resolution	400 ± 20% DPI
		Tracking speed	10 in/s maximum
		Acceleration	100 in/s
		Switch actuation	65 g nominal peak force
		Switch life	1,000,000 operations (using Hasco modified tester)
		Switch type	Low force micro-switches
		Tracking mechanism life	155 mi (250 km) at average speed of 10 in/s
		Cable length	6 ft (1.8 m)
		Microsoft PC99 – 2001	Mechanically compliant
	Scroll wheel	Width	8 mm
		Diameter	0.99 in (25.2 mm)
		Maximum rotation speed	30 mm/s
		Switch type	Light force micro-switch
		Switch life	1 million operations
		Mechanical life	Minimum 200,000 revolutions
	Regulatory approvals	Compliant	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC

USB Optical Scroll Mouse	Dimensions (H x L x W)	1.5 x 4.5 x 2.5 in (3.8 x 11.6 x 6.3 cm)
	Weight	0.27 lb (0.12 kg)
	Cable length	72.8 in (185 cm)

Technical Specifications - Optical Storage

SATA DVD+/-RW LightScribe Drive	Height	5.25-inch, half-height, tray-load	
	Orientation	Either horizontal or vertical	
	Interface type	SATA/ATAPI	
	Disc capacity	8.5 GB DL or 4.7 GB standard	
	Dimensions (HxWxD)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)	
	Weight (maximum)	2.6 lb (1.2 kg)	
	Write speeds	DVD+R	Up to 16X
		DVD+RW	Up to 8X
		DVD+R DL	Up to 8X
		DVD-R DL	Up to 4X
		DVD-R	Up to 16X
		DVD-RW	Up to 6X
		CD-R	Up to 48X
		CD-RW	Up to 32X
	Read speeds	DVD-RAM	Up to 4X
		DVD+RW, DVD-RW, DVD+R DL, DVD-R DL	Up to 8X
		DVD-ROM, DVD+R, DVD-R	Up to 16X
		CD-ROM, CD-R	Up to 48X
		CD-RW	Up to 32X
	Access time (typical reads, including settling)	Random	DVD: < 130 ms (typical), CD: < 120 ms (typical)
		Full Stroke	DVD: < 240 ms (seek), CD: < 200 ms (seek)
	Power	Source	SATA DC power receptacle
		DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p
			12 VDC ± 5%-200 mV ripple p-p
		DC Current	5 VDC (< 1000 mA typical, < 1600 mA maximum)
			12 VDC (< 600 mA typical, < 1400 mA maximum)
	Environmental conditions (operating - non-condensing)	Temperature	41° to 122° F (5° to 50° C)
		Relative humidity	10% to 90%
		Maximum wet bulb temperature	86° F (30° C)

Technical Specifications - Optical Storage

SATA DVD-ROM Drive	Height	5.25-inch, half-height, tray-load	
	Orientation	Either horizontal or vertical	
	Interface type	SATA/ATAPI	
	Disc capacity	Single layer: Up to 4.7 GB (6 times capacity of CD-ROM) Double layer: Up to 8.5 GB (12 times capacity of CD-ROM)	
	Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)	
	Weight (max)	2.6 lb (1.2 kg)	
	Read speeds	DVD+R/-R/+RW/ -RW/+R DL /-R DL	Up to 8X
		DVD-ROM	Up to 16X
		DVD-RAM	Up to 4X
		CD-ROM, CD-R	Up to 48X
		CD-RW	Up to 32X
	Removable Storage – Media Compatibility – DVD-ROM	Media (READ ONLY – drive is not write capable) CD-ROM CD-R CD-RW DVD-ROM DVD-ROM DL DVD-RAM DVD+R DVD+R DL DVD+RW DVD-R DVD-RW DVD-R DL	
	Access times (typical reads, including setting)	Random	DVD: < 140 ms (typical), CD: < 125 ms (typical)
		Full Stroke	DVD: < 250 ms (seek), CD: < 210 ms (seek)
		Cache Buffer	2 MB (minimum)
		Data Transfer Modes	ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 (44.4 MB/s -default)
	Power	Source	SATA DC power receptacle
		DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p
			12 VDC ± 5%-200 mV ripple p-p
		DC Current	5 VDC (< 1000 mA typical, < 1600 mA maximum)
			12 VDC (< 600 mA typical, < 1400 mA maximum)
	Environmental (all conditions non-condensing)	Temperature	41° to 122° F (5° to 50° C)
		Relative Humidity	10% to 90%
		Maximum Wet Bulb Temperature	86° F (30° C)

Technical Specifications - Environmental Data

Eco-Label Certifications and declarations

This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

- US Federal Energy Management Program (FEMP)
- IT ECO declaration
- Korea Eco-label
- Japan PC Green label**
- CECP Certification (China Energy Conservation Program)

** This product conforms to the examination standards (2003 version) under JEITA's 'PC Green Label System.'

Energy Consumption

	115 VAC, 60 Hz	230 VAC, 50 Hz	100 VAC, 60 Hz
Normal Operation	62.9 W	61.8 W	63.1 W
Sleep (ENERGY low power mode)	3.1 W	3.4 W	3 W
Off	1.06 W	1.35 W	1.04 W

Heat Dissipation*

	115 VAC, 60 Hz	230 VAC, 50 Hz	100 VAC, 60 Hz
Normal Operation	214.614 BTU/hr	210.861 BTU/hr	215.297 BTU/hr
Sleep	10.577 BTU/hr	11.6 BTU/hr	10.236 BTU/hr
Off	3.616 BTU/hr	4.606 BTU/hr	3.548 BTU/hr

* Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

This product is in compliance with US executive order 13221, WOL (wake on LAN) disabled.

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)

System Fan Off	Sound Power (L_{Wad}, bels)	Sound Pressure (L_{pAm}, decibels)
Idle	3.61	28.2 dB(A)
Fixed Disk (random writes)	3.8	30.2 dB(A)
Optical Drive (sequential reads)	4.9	44.3 dB(A)

Longevity and Upgrading

This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the product include:

- Higher endurance capacitors for longer life.
- Higher temperature rated capacitors for longer life and reliability
- Improved gold plating on connectors, ports, and add-in cards for longer life and reliability
- Over current protection using polyfuses for USB, serial, PS/2, and video ports for improved reliability and hardware protection
- On-board thermal sensors for improved reliability and thermal protection
- More stringent thermal and humidity testing inside a special cabinet to simulate a thermally harsh POS environment

Spare parts are available throughout the warranty period and or for up to 5 years after the end of production.

Batteries

This product complies with ISO standards:

- EU Directive 91/ 157/ EEC

- EU Directive 93/ 86/ EEC
- EU Directive 98/ 101/ EEC

Batteries used in the product do not contain:

- Mercury greater the 5 ppm by weight
- Cadmium greater than 10 ppm by weight
- Lead greater than 15 ppm by weight.

Battery size: CR2032 (coin cell)
Battery type: Lithium/Manganese Dioxide

Additional Information

- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive – 2002/95/EC.
- This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.
- Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.
- The rp5700 Point of Sale System contains an average of 10% post-consumer recycled plastic.
- This product is >91% recyclable when properly disposed of at end of life.

Packaging Materials		
	Corrugated Paper	1407 g
	EPE Foam	290 g
	LDPE Bag	63.5 g
	HIPS Cushion	127.01 g

- The EPE foam packaging material is made from no post consumer recycled content.
- The corrugated paper packaging materials contain at least 25% post consumer recycled content.

Material Usage

This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants – may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde
- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)

- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

Packaging

HP follows these guidelines to decrease the environmental impact of product packaging:

- Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.
- Eliminate the use of ozone-depleting substances (ODS) in packaging materials.
- Design packaging materials for ease of disassembly.
- Maximize the use of post-consumer recycled content materials in packaging materials.
- Use readily recyclable packaging materials such as paper and corrugated materials.
- Reduce size and weight of packages to improve transportation fuel efficiency.
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

End-of-life Management and Recycling

Hewlett-Packard offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/recyclers. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

Hewlett-Packard Corporate Environmental Information

For more information about HP's commitment to the environment:

Global Citizenship Report
http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html
Eco-label certifications
http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html
ISO 14001 certificates:
http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html

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Certain Windows Vista product features require advanced or additional hardware. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit: http://www.windowsvista.com/upgradeadvisor. For Windows Vista system requirements, visit: http://www.windowsvista.com/systemrequirements.

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